Name: Date:

Polynomial Factoring solution (version 40)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-48}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{2 \pm 4\sqrt{3}\,i}{2}$$

$$x = 1 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-4 + 3i$ and $6 - 7i$ in standard form $(a + bi)$.**

Solution

$$(-4 + 3i) \cdot (6 - 7i)$$

$$-24 + 28i + 18i - 21i^2$$

$$-24 + 28i + 18i + 21$$

$$-24 + 21 + 28i + 18i$$

$$-3 + 46i$$

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3. **Write function $f(x) = x^3 - 4x^2 - 4x + 16$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-4	-4	16
-2		-2	12	-16
	1	-6	8	0

$$f(x) = (x + 2)(x^2 - 6x + 8)$$

$$f(x) = (x + 2)(x - 2)(x - 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 6)^2 \cdot (x + 2) \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.